

WHAT IS CLAIMED IS:

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1. In a radiocommunication system, a method for transmitting a signal comprising the steps of:
  - splitting the signal along a plurality of antenna paths, wherein the signal includes a number of positions, each of the number of positions including a sample;
  - receiving the signal in an antenna path;
  - shifting the samples of the signal a predetermined number of positions, wherein samples shifted beyond the number of positions in the signal are shifted into a number of positions at a beginning or the end of the signal;
  - including a number of samples from an end of the signal in a guard interval; and
  - transmitting the signal and the guard interval.
2. The method of claim 1, wherein the predetermined number of positions corresponds to a position of the antenna path with respect to the number of antenna paths.
3. The method of claim 1, wherein the predetermined number of positions corresponds to whether the signal is being retransmitted.
4. The method of claim 1, wherein the samples are shifted toward the end of the signal and wherein samples shifted beyond the end of the signal are shifted into the beginning of the signal.
5. The method of claim 1, wherein the samples are shifted toward the beginning of the signal and wherein samples shifted beyond the beginning of the signal are shifted into the end of the signal.

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A2

6. The method of claim 1, wherein the signal is an orthogonal frequency division multiplexed symbol.

7. The method of claim 1, further comprising the steps of:  
receiving the signal in another antenna path; and  
5 shifting the samples of the signal in the another antenna path another predetermined number of positions,

wherein the predetermined number of positions and the another predetermined number of positions are a different number of positions.

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A2

10 8. The method of claim 1, further comprising the steps of:  
applying error protection coding to the signal;  
interleaving the samples, wherein the samples are interleaved such that after de-interleaving, subcarriers with a lowest correlation are placed in positions next to each other;

15 performing an inverse fast Fourier transform on the interleaved coded symbols to form a resultant signal; and  
providing the resultant signal to each of the antenna paths.

20 9. The method of claim 1, further comprising the steps of:  
performing an inverse fast Fourier transform on the signal; and  
attenuating the signal in each antenna path.

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10. The method of claim 1, wherein the number of samples included in the guard interval are taken from the end of the signal and the guard interval is attached to the beginning of the signal.

5 11. The method of claim 1, wherein the number of samples included in the guard interval are taken from the beginning of the signal and the guard interval is attached to the end of the signal.

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10 12. An apparatus for transmitting signals comprising:  
an input for receiving a signal to be transmitted, wherein the signal to be transmitted includes a number of positions, each of the number of positions including a sample;  
a first antenna path; and  
a second antenna path, wherein the second antenna path shifts the samples of the signal a predetermined number of positions,  
wherein samples shifted beyond the number of positions in the signal are  
15 shifted the predetermined number of positions into a beginning or an end of the signal.

20 13. The apparatus of claim 12, further comprising:  
a third antenna path, wherein the third antenna path shifts the samples of the signal another predetermined number of positions,  
wherein samples shifted beyond the number of positions in the signal are shifted the another predetermined number of positions into a beginning or an end of the signal.

14. The apparatus of claim 13, wherein the predetermined number of positions corresponds to a position of the second antenna path with respect to the

first and third antenna paths and the another predetermined number of positions corresponds to a position of the third antenna path with respect to the first and second antenna paths.

5           15.    The apparatus of claim 12, wherein the samples are shifted toward the end of the signal and wherein samples shifted beyond the end of the signal are shifted into the beginning of the signal.

          16.    The apparatus of claim 12, wherein the samples are shifted toward the beginning of the signal and wherein samples shifted beyond the beginning of the signal are shifted into the end of the signal.

10           17.    The apparatus of claim 12, further comprising:  
              means for applying an error correction code to signal; and  
              an interleaver.

          18.    The apparatus of claim 12, wherein the first and second antenna paths include means for adding a guard interval to the signal in the respective  
15    antenna path prior to transmission of the signal from each antenna path.

          19.    The apparatus of claim 18, wherein the guard interval is added to the beginning of the signal.

          20.    The apparatus of claim 18, wherein the guard interval is added to the end of the signal.

20           21.    A radio transmission system comprising:  
              a transmitter including

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an input for receiving a signal to be transmitted, wherein the signal to be transmitted includes a number of positions, each of the number of positions including a sample;

a first antenna path; and

5 a second antenna path, wherein the second antenna path shifts the samples of the signal a predetermined number of positions, wherein samples shifted beyond the number of positions in the signal are shifted the predetermined number of positions into a beginning or an end of the signal; and

a receiver including

10 a first and second antenna path, wherein the receiver performs a signal quality enhancing combining using signals received on the first and second antenna paths of the receiver.

22. The system of claim 21, wherein the samples are shifted toward the end of the signal and wherein samples shifted beyond the end of the signal are  
15 shifted into the beginning of the signal.

23. The system of claim 21, wherein the samples are shifted toward the beginning of the signal and wherein samples shifted beyond the beginning of the signal are shifted into the end of the signal.

24. The system of claim 21, wherein  
20 the transmitter further includes  
means for performing an inverse fast Fourier transform; and  
means for adding a prefix to the signal in each antenna path;

and

the receiver further includes  
25 means for removing the prefix; and  
means for performing a fast Fourier transform.

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25. The system of claim 21 wherein  
the transmitter further includes  
means for applying error protection coding to the signal to form  
5 coded symbols; and  
means for interleaving the coded symbols;  
the receiver further includes  
means for removing de-interleaving received subcarriers; and  
means for decoding the de-interleaved subcarriers,  
10 wherein the coded symbols are interleaved such that after de-interleaving,  
subcarriers with a lowest correlation are placed in positions next to each other.

26. The system of claim 21, wherein the signal quality enhancing  
combining is a maximum ratio combining.

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